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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/258,961 03/01/99 JIANG

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EXAMINER

PAREKH, N

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

10/13/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

## Office Action Summary

Application No.  
09/258,961

Applicant(s)

Jiang et al

Examiner

Nitin Parekh

Group Art Unit  
2811 Responsive to communication(s) filed on Jul 31, 2000 This action is FINAL. Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle 1035 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

### Disposition of Claim

 Claim(s) 24-36 is/are pending in the application

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration

 Claim(s) \_\_\_\_\_ is/are allowed. Claim(s) 24-36 is/are rejected. Claim(s) \_\_\_\_\_ is/are objected to. Claims \_\_\_\_\_ are subject to restriction or election requirement.

### Application Papers

 See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948. The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner. The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved. The specification is objected to by the Examiner. The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

 Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d). All  Some\*  None of the CERTIFIED copies of the priority documents have been received. received in Application No. (Series Code/Serial Number) \_\_\_\_\_ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

 Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

### Attachment(s)

 Notice of References Cited, PTO-892 Information Disclosure Statement(s), PTO-1449, Paper No(s). 2 and 6 Interview Summary, PTO-413 Notice of Draftsperson's Patent Drawing Review, PTO-948 Notice of Informal Patent Application, PTO-152

-- SEE OFFICE ACTION ON THE FOLLOWING PAGES --

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
2. Claims 24-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Lee et al (US Pat. 5796586).

Regarding claims 24 and 25, the admitted prior art (Fig.1A and B; pages 2-4) et al discloses a semiconductor package comprising :

  - a substrate comprising a first surface , a second surface and a plurality of conductors and ball bonding pads formed on a first surface
  - a semiconductor die bonded to the second surface and having a first outline
  - first mask on the first surface of the substrate comprising a plurality of via openings to the ball bonding pads, and
  - a second mask substantially covering a second surface of the substrate
  - an adhesive layer between the die and the substrate in the die attach area
  - an encapsulating material encapsulating the die and the second mask, and

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- a glob top in the bonding opening encapsulating the wires.

The admitted prior art fails to specify directly bonding the die to the second surface and having an opening in the second mask including a second outline substantially matching the first outline to define the die attached area on the second surface. Lee et al teach using a second mask having an opening through the mask with a second outline (see hatched mask area 218' with a second outline- Fig. 7; Col. 7, line 55) substantially matching that of the first outline with an open die attach area (see first outline area 204- Fig. 7) on the second surface so that the die is directly bonded to the second surface so that the solder mask can provide a better resistance against cracking at the substrate surface than using an adhesive (Fig. 7 and Fig. 1-6; Col. 1-8).

Furthermore, Lee et al disclose die attach area, conventionally, not being covered with solder mask so that the die attaches directly to the substrate surface (Col. 8, line 7). Therefore, it would have been obvious to the person of ordinary skill in the art at the time invention was made to use a second mask having an opening and a second outline substantially matching the first outline to define the die attached area on the second surface so that the die is bonded directly to the second surface to prevent the cracking of the solder mask using Lee et al's mask outline/design in the admitted prior art as cited in claims 24 and 25.

Regarding claim 26, the admitted prior art discloses a die aligned with the wire bonding opening in the substrate; bonded circuit side down to the second surface and wire bonded to the conductors.

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Claims 27-29 are rejected as explained above for claim 24-26.

Claims 30-33 are rejected as explained above for claims 24-26.

Claims 34 and 35 are rejected as explained above for claims 24-26.

Regarding claim 36, the admitted prior art in view of Lee et al fails to specify using an adhesive material selected from a group consisting of epoxies, acrylics and polyimide. However, it is conventional in the chip packaging art to use such materials as an adhesive. Therefore, it would have been obvious to the person of ordinary skill in the art at the time invention was made to use an adhesive material selected from a group consisting of epoxies, acrylics and polyimide to improve adhesion in the admitted prior art in view of Lee et al as cited in claim 36.

*Response to Arguments*

3. Applicant's arguments with respect to claims 24-36 have been considered but are moot in view of the above rejections which clearly establish that the amended claims are *prima facie* obvious over the admitted prior art and Lee et al.

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4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted directly to Art Unit 2811 by facsimile transmission. Papers should be faxed to Art Unit via Technology Center 2800 fax center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is (703) 305-3410. The examiner can be normally reached on Monday-Friday from 08:30 am-5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached on (703) 308-2772. The fax number for the organization where this application or proceeding is assigned is (703) 308-7722 or 7724.

Nitin Parekh

10-10-2000

Tom Thomas